REMARKS

Claims 2-28 are pending in the application. Claims 2-28 stand rejected. Claims 3-5, 9, 26, and 28 have been amended. Claims 2-28 remain in the application.

The specification has been amended to incorporate language from U.S. Patent No. 6,282,317, which is incorporated by reference in the application.

Rejection of Claims 3-12, 26, and 28 under 35 U.S.C. 102(e)

Claims 3-12,26 and 28 stand rejected under 35 U.S.C. 102(e) as being anticipated by Takiguchi et al. (US Patent 6,549,681 B1). The rejection stated:

'Regarding claim 5, Takiguchi et al. discloses a method for producing a cropped digital image, comprising the steps of:

'a) providing a plurality of partially overlapping source digital images (fig. 64a, numerals 61 and 62);

'b) providing a cropping aspect ratio L:H (fig. 67, labels pl-p4), the cropping aspect ratio being the ratio of the length (p1 and p2) to the height (p1 and p4) of the cropped digital image;

'c) providing a cropping criterion (fig. 67, label: CONDITION), the cropping criterion being a criterion for the size and location (Fig. 67, label: CONDITION has a plurality of associated formulas that inherently describe size and location.) of the cropped digital image;

'd) combining the source digital images to form a composite digital image
(Fig. 62);

'e) automatically selecting (or "automatically extract-ing" in col. 5, lines 57,58) the cropping region ("rectangular area" in col. 5, line 59) of the composite digital image according the cropping criterion, said cropping region being a rectangular region having aspect ratio L:H (Fig. 67, labels: the length of p1 and p2: and the length of p1 and p4), and having size and location determined by the cropping criterion; and

'f) cropping the composite digital image to the cropping region to form a cropped digital image (Fig. 64D);

'g) wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area (Fig. 64A-64C clearly shows the claimed "largest in area.") of the set of all composite digital image regions having aspect ratio L:H (determined according to the

formulas of fig. 67) that are centered (Figures 64A-64C clearly show the claimed "centered.") at the centroid ("middle point" in col. 41, line 55) of the main subject ("rectangular area" in col. 41, line 53) of the composite digital image.

'Claims 3 including limitation "a)", 4 and 28 are rejected the same as claim 5. Thus, argument similar to that presented above for claim 5 is equally applicable to claims 3, "a)", 4 and 28.

'Regarding claim 2, Takiguchi et al. discloses the method claimed in claim 3, wherein the step of providing source digital images further comprises:

'a) the step of digitizing source photographic images (fig. 55, num. 7 is an "electronic camera" in col. 41, lines 45,46 that inherently captures electronic or digital images.) to form source digital images.

'Regarding claim 6, Takiguchi et al. discloses the method claimed in claim 3, further comprising the step of:

'g) resizing the cropped digital image for display (Fig. 69, num. 101 is a resized image as compared to image 106 of fig. 69.).

'Regarding claim 7, Takiguchi et al. discloses method claimed in claim 3, further comprising the step of:

'g) resizing the cropped digital image (as mentioned in claim 6) for hardcopy output (Fig. 40, step S3601. Note that Takiguchi et al. states that the "present invention is not limited to the specific embodiments described in the specification" in col. 63, lines 53,54. Thus the printer of fig. 40 of one embodiment can be used with the embodiment of fig. 55.).

'Regarding claim 8, Takiguchi et al. discloses the method claimed in claim 3, further comprising the step of:

'g) transforming the pixel values (Fig. 55, num. 18) of the cropped digital image to an output device compatible color space (Fig. 2 is a display with a certain size or space.).

'Regarding claim 9, Takiguchi et al. discloses the method in claim 3, wherein the source digital images have pixel values that are linearly or logarithmically related to scene intensity (Fig. 24,label "al" shows a "smooth continuation of the image lines "col.
2, lines 8,9).

'Claim 10 is rejected the same as claim 9. Thus, argument similar to that presented above for claim 9 is equally applicable to claim 10 except for

the additional limitation of a metric transform or "histogram" in col. 12, line 44 and shown in fig. 24.

'Regarding claim 11, Takiguchi et al. discloses the method of claim 9, wherein the step of providing source digital images further comprises:

'a) applying linear exposure transform(s) (or "coor-dinate transformation" in col. 40, lines 16,17.) to one or more of the source digital images to produce source digital images having pixel values that closely match (The above mentioned coordinate transformation is used for "matching" in col. 40, line 4 as shown in fig. 62.) in an overlapping region.

'Claim 12 is rejected the same as claim 11. Thus, argument similar to that presented above for claim 11 is equally applicable to claim 12 except for the limitation of exposure falloff or "shift" in col. 1, line 65 or "shifting", in col. 39, line 66 in terms of a "lens" in col. 1, line 64 during recording.

'Regarding claim 26, Takiguchi et al. discloses a system for producing a cropped digital image, comprising:

'a) a plurality of partially overlapping source digital images (fig. 64a, numerals 61 and 62);

'b) means for specifying (Fig. 66 includes a table column labeled: EXTRATION AREA as a means for specifying.) a cropping aspect ratio L:H (fig. 67, labels p1-p4), the cropping aspect ratio being the ratio of the length (p1 and p2) to the height (p1 and p4) of the cropped digital image;

'c) means for specifying (Fig. 66 includes a table column labeled: CONDITION as a means for specifying.) a cropping criterion (fig. 67, label: CONDITION), the cropping criterion being a criterion for the size and location (Fig. 67, label: CONDITION has a plurality of associated formulas that inherently describe size and location.) of the cropped digital image;

'd) means for combining the source digital images (Fig. 59 is a means for combining or "MATCHING" in fig. 59,step S11.) to form a composite digital image (Fig. 62);

'e) means for automatically (Fig.55, num. 28 is an "automatic" in col. 41, lines 51-53 process.) selecting (or "automatically extract-ing" in col. 5, lines 57,58) the cropping region ("rectangular area" in col. 5, line 59) of the composite digital image according the cropping criterion, said cropping region being a rectangular region having aspect ratio L:H (Fig. 67, labels: the length of

p1 and p2: and the length of p1 and p4), and having a size and location determined by the cropping criterion; and

'f) means for cropping (Fig. 68, step S52 is a means for cropping or extracting.) the composite digital image to the cropping region to form a cropped digital image (Fig. 64D);

'g) wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area (Fig. 64A-64C clearly shows the claimed "largest in area.") of.

'g1) the set of all composite digital image regions (fig. 67 shows two image regions labeled A for one image and C for the other image.) having aspect ratio L:H (p1-p4 determined according to the formulas of fig. 67).'

Claim 3 has been amended to state:

3. A method for producing a cropped digital image, comprising the steps of:

providing a plurality of partially overlapping source digital images;

providing a cropping aspect ratio L:H, the cropping aspect ratio being the ratio of the length to the height of the cropped digital image;

providing a cropping criterion, the cropping criterion being a criterion for the size and location of the cropped digital image;

combining the source digital images to form a composite digital image;

automatically selecting the cropping region of the composite digital image according to the cropping criterion, said cropping region being a rectangular region having said aspect ratio L:H, and having size and location determined by the cropping criterion; and,

cropping the composite digital image to the cropping region to form a cropped digital image;

wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of one of the sets:

a) the set of all composite digital image regions having said aspect ratio L:H;

b) the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the composite digital image; and

c) the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image;

and wherein the source digital images have pixel values that are linearly or logarithmically related to scene intensity and the step of providing source digital images further comprises applying a metric exposure transform to a source digital image such that the pixel values of the source digital image are linearly or logarithmically related to scene intensity.

The amended language of Claim 3 is supported by the application as filed, notably original Claims 9-12.

Claim 3 requires that source digital images have pixel values that are linearly or logarithmically related to scene intensity and the step of providing source digital images includes applying a metric exposure transform to a source digital image such that the pixel values of the source digital image are linearly or logarithmically related to scene intensity. Features inclusive of applying an exposure transform are discussed in the rejection in relation to Claims 11 and 12:

'Regarding claim 11, Takiguchi et al. discloses the method of claim 9, wherein the step of providing source digital images further comprises:

'a) applying linear exposure transform(s) (or "coordinate transformation" in col. 40, lines 16,17.) to one or more of the source digital images to produce source digital images having pixel values that closely match (The above mentioned coordinate transformation is used for "matching" in col. 40, line 4 as shown in fig. 62.) in an overlapping region.

'Claim 12 is rejected the same as claim 11. Thus, argument similar to that presented above for claim 11 is equally applicable to claim 12 except for the limitation of exposure falloff or "shift" in col. 1, line 65 or "shifting", in col. 39, line 66 in terms of a "lens" in col. 1, line 64 during recording.

All of the referenced portions of Takiguchi et al. relate to the application of geometric transforms that change pixel locations not exposure transforms that change pixel intensities. Takaguichi et al. states:

"Further, when an image is recorded with an electronic camera, the portion of the image that is located at the periphery of a lens is more or less distorted. This also causes a shift of less than one pixel." (Takaguichi et al., col. 1, lines 63-65; emphasis added)

A "shift" described in units of pixels is geometric. Takaguchi et al. further states:

"The shifting of two images when they are synthesized can be represented by a difference between translation distances and rotations in the x and y directions, and a difference in magnification rates (since, for synthesization of more than two images, two-image synthesization is repeated, two images are employed for this explanation). The matching points (x,y) and (x',y') are represented as follows. [equation omitted] where θ denotes a rotation angle, Δx and Δy denote translations, and m denotes a magnification rate. This coordinate transformation can be represented by acquiring parameters A, B, C, and D." (Takaguchi et al., col. 39, line 66 to col. 40, line 18; see also Figure 62)

The geometric positions (coordinates) of the pixels in Takaguichi et al. are transformed. This contrasts with Claim 3, which requires applying a metric exposure transform to a source digital image such that the pixel values of the source digital image are linearly or logarithmically related to scene intensity.

Claims 2 and 6-8 are allowable as depending from Claim 3.

Claims 4 and 28 are supported and allowable on the same grounds as Claim 3.

Claim 5 states:

5. A method for producing a cropped digital image, comprising the steps of:

providing a plurality of partially overlapping source digital images;

providing a cropping aspect ratio L:H, the cropping aspect ratio being the ratio of the length to the height of the cropped digital image;

providing a cropping criterion, the cropping criterion being a criterion for the size and location of the cropped digital image;

combining the source digital images to form a composite digital image;

automatically computing a main subject of the composite digital image using a reasoning engine;

automatically selecting the cropping region of the composite digital image according to the cropping criterion, said cropping region being a rectangular region having said aspect ratio L:H, and having size and location determined by the cropping criterion; and,

cropping the composite digital image to the cropping region to form a cropped digital image;

wherein the cropping criterion specifies that the cropped digital image is the composite digital image region that is largest in area of the regions of the set of all composite digital image regions having said aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image.

The amended language of Claim 5 is supported by the application as filed, notably the original claims and at page 8, line 26 to page 9, line 3; also see language above, incorporated by reference from U.S. Patent No. 6,282,317.

Claim 5 requires automatically computing a main subject of the composite digital image using a reasoning engine and automatically selecting the cropping region according to the cropping criterion that specifies the composite digital image region that is largest in area of the set of all composite digital image regions having aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image. The rejection indicated that Takiguchi et al. disclosed the cropping criterion specifying that the cropped digital image was the composite digital image region that was largest in area of the set that are centered:

'at the centroid ("middle point" in col. 41, line 55) of the main subject ("rectangular area" in col. 41, line 53) of the composite digital image.'

This portion of Takiguchi et al. states:

"The image extraction unit 28 of the present invention provides a plurality of extraction methods, so that it can automatically extract a rectangular area in consonance with images that constitute a panoramic image, or it can extract it by calculating a middle point for the inclined portion." (Takiguchi et al., col. 41, lines 51-55; emphasis added)

This sentence describes two different extraction methods. The rejection incorrectly combines them into one. In any case, the discussed extraction methods do not disclose or suggest automatically computing a main subject of the composite digital image using a reasoning engine, as required by Claim 5.

Claims 9-12 are allowable as depending from Claim 5. Claims 11-12 are also allowable on the grounds discussed above in relation to Claim 3.

Claim 26 is supported and allowable on the same grounds as Claim 5.

Rejection of Claims 3, 13-14, 16, and 27 under 35 U.S.C. 103(a)

Claims 3, 13-14, 16, and 27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1).

Claim 3 is allowable on the grounds discussed above. (See particularly the discussion of the language of Claims 11-12.)

Claims 13-14, 16, and 27 are allowable as depending from Claim 3.

Rejection of Claim 5 under 35 U.S.C. 103(a)

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Armstrong et al. (US Patent 6,580,457 B1). The rejection stated:

> 'Regarding claim 5, Burt et al. discloses a method for producing a cropped digital image, comprising the steps of:
>
> 'a) providing (Fig. 3, label "INPUT IMAGE".) a plurality of partially overlapping source digital images (Fig. 2A shows a plurality of partially overlapping images which are used to generate a mosaic image.);
>
> 'b)providing a cropping aspect ratio L:H (Fig. num. 302 provides a "cropping... size" in col. 6, line 15), the cropping aspect ratio being the ratio of the length to the height of the cropped digital image;
>
> 'c) providing a cropping criterion ("parameters" in col. 11, line 3 are used as criteria for "cropping functions" in col. 2, line 32 or a "cropping function" in col.11, line
> 3.), the cropping criterion being a criterion for the size and location of the cropped digital image (or "region of interest" in col. 11, line 3 inherently has a size and location.);
>
> 'd) combining (Fig. 3,num. 304:COMBINATION PROCESS) the source digital images (Fig. 2A shows a plurality of partially overlapping images for combining.) to form a composite digital image (Fig. 2A shows a, plurality of partially overlapping images which are used to generate a mosaic image.);
>
> 'e) automatically selecting (Fig. 3,num. 302: SELECTION PROCESS is a means for an "automatic[ ]" in col. 10, line 56 "sèlection

function[ ]" in col. 10, line 55. Where the "selection functions may include cropping" in col. 10, line 53. Thus, fig. 3,num. 302 automatically selects cropping as indicated in fig. 5,num. 504: CROPPING.) the cropping region (Fig. 3,num. 302: SELECTION PROCESS is a means for an "automatic[ ]" in col. 10, line 56 "selection function[ ]" in col. 10, line 55 that corresponds to a cropping function that crops a region or "[image] portion[ ]" in col. 2, line 33.) of the composite digital image (Fig. 3,num. 302: SELECTION PROCESS is a means for an "automatic[ ]" in col. 10, line 56 "selection function[ ]" in col. 10, line 55 that corresponds to a cropping function that crops a region or "[image] portion[ ]" in col. 2, line 33 of the composite digital image or mosaic image of figure 2A.) according to

'e1) the cropping criterion (Fig. 3,num. 302: SELECTION PROCESS is a means for an "automatic[ ]" in col. 10, line 56 "selection function[ ]" in col. 10, line 55 that corresponds to a cropping function which crops a region or "[image] portion[ ]" in col. 2, line 33 of the composite digital image or mosaic image of figure 2A according to the cropping criterion of fig. 5, step 502:SELECT SELECTION FUNCTION AND PARAMETERS which uses "parameters to control the cropping function" in col. 11, lines 2-4.),

'e11) said cropping region (or "[image] portion[ ]" in col. 2, line 33.) being

'e111) a rectangular region (or a shape as mentioned in fig. 5,num. 506. Note that the shape of fig. 5,num. 506 corresponds to "cropping functions" in col. 2, line 32 and "cropping function" in col. 11, line 3 and image portion of col. 2, line 33 since an image portion does have a shape.) having said aspect ratio L:H ("cropping ... size" in col. 6, line 15.), and

'e112) having size ("cropping... size" in col. 6, line 15.) and location ("select[ed]... portion" in col. 2, lines 32,33 includes "cropping functions" in col. 2, line 32 that corresponds to a region of interest of fig. 5,num. 506.) determined by the cropping criterion ("parameters to control the cropping function" in col. 11, lines 2-4.); and

f) cropping (Fig. 5, step 518:APPLY SELECTION FUNCTION crops the image based on step 506 of fig. 5.) the composite digital image (mosaic image of figure 2A.) to the cropping region to form a cropped digital image (at the output of step 518: APPLY SELECTION FUNCTION.);

'Burt et al. does not teach the remaining limitation of claim 5, but does suggest that a user can select a size or "select a region of interest" in col. 11, line 4. Thus, a user can select any size from small to large.

'However, Armstrong et al., in the field of endeavor of electronic photography, teaches a cropping criterion (Fig. 9,num. 81:# VERTICAL LINES=TOTAL VERTICAL LINES IN IMAGER) that specifies that a cropped digital image (Figure 5a contains a smaller rectangle labeled: MODE 1 640 X 480 IMAGE) is the composite digital image region (The smaller rectangle labeled: MODE 1 640 X 480 IMAGE.) that is largest in area (The smaller rectangle contains the largest area of the image of fig. 5a.) of the set of all composite digital image regions (Fig 5a has regions of a top, bottom, left, and right regions which are labeled as "CROPPED".) having aspect ratio L:H (In reference to the bottom cropped margin; 640 for the length and 18 lines high.)

'It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Burt et al.'s teaching of selecting a size for dropping with Armstrong et al.'s teaching of selecting a larger size for cropping because "The images remain of good quality with a faster overall frame rate [for all modes 1-3 in col. 5, lines 6-9] (Armstrong et al., col. 5, lines 27-29)." Note that mode 1 corresponds to the image of figure 5a.'

This rejection, which was maintained from the earlier Office Action, was explained in Paragraph 7 of the Advisory Action:

'7. Regarding claims 3-5, applicant's arguments filed 7/15/2005 on page 12, 2nd paragraph to last paragraph:

'The rectangle indicated by 'MODE 1 640 X 480 IMAGE' in Figure 5a of Burt et al. is not the largest in area cropped digital region available in Figure 5a having the same aspect ratio."

';however, the rectangle indicated by 'MODE 1 640 X 480 IMAGE' in Figure 5a of Burt et al. is the largest in area cropped digital region available in Figure 5a having **an** (emphasis added) aspect ratio.' (emphasis in original)

Claim 5 has been amended to require "said aspect ratio L:H" of the providing step. Claim 5 is also allowable, as requiring automatically computing a main subject of the composite digital image using a reasoning engine and automatically selecting the cropping region according to the cropping criterion that specifies the composite digital

image region that is largest in area of the set of all composite digital image regions having aspect ratio L:H that are centered at the centroid of the main subject of the composite digital image. The rejection notes user selection in Burt:

> 'Burt et al. does not teach the remaining limitation of claim 5, but does suggest that a user can select a size or "select a region of interest" in col. 11, line 4. Thus, a user can select any size from small to large.'

Neither cited reference discloses any compution of a main subject.

Rejection of Claim 15 under 35 U.S.C. 103(a)

Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 B1).and further in view of Seitz et al. (View Mophing, Proceedings of the 23rd annual conference on Computer graphics and interactive techniques, ACM Press, 1996, pp. 21-30).

Claim 15 is allowable as depending from Claim 3.

Rejection of Claims 17-18 and 22-24 under 35 U.S.C. 103(a)

Claims 17-18 and 22-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 131) further in view of Yoshida et al. (US Patent 6,266,128 B1).

Claims 17-18 and 22-24 are allowable as depending from Claim 3.

Rejection of Claims 19-21 and 25 under 35 U.S.C. 103(a)

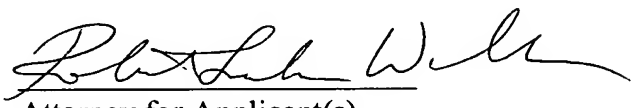
Claims 19-21 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Burt et al. (US Patent 5,649,032 A) in view of Takiguchi et al. (US Patent 6,549,681 131) further in view of Suzuki et al. (US Patent 6,094,218 A).

Claims 19-21 and 25 are allowable as depending from Claim 3.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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